

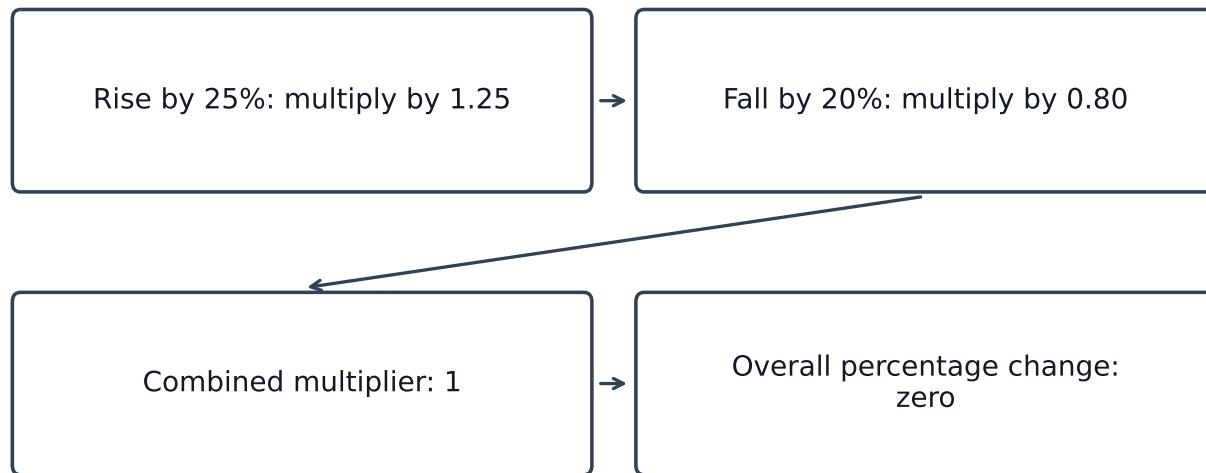
Exercise walk-through

11.1

Arithmetic: divisibility, remainders and multiplicative change

GRE · GRE · GRE General Test

Figure 12: Worked reasoning



Check the labelled values and conditions.

15. Model and reasoning

Model and reasoning

$36 = 2^2 \cdot 3^2$, $60 = 2^2 \cdot 3 \cdot 5$. Shared smaller powers give GCF=12; larger required powers give LCM=180. Their product $12 \cdot 180 = 36 \cdot 60$ checks the result. The price multiplier is $1.25 \cdot 0.80 = 1$, so the overall change is zero percent. The two changes use different reference prices; adding +25 and -20 would give a wrong five-percent increase.

17. Reasoning and check

Reasoning and check

Write $n = 8k + 5$ for integer k . Then $3n + 7 = 24k + 22 = 8(3k + 2) + 6$, so the remainder is six for all integer k . The final value is 1.32 times the original. Restoring it multiplies by $1/1.32 = 25/33$, a reduction of $1 - 25/33 = 8/33$, or about 24.24%. A 30% reduction does not reverse compounded growth. The remainder convention uses $0 \leq r < 8$ even when n is negative.

Exercises 2.1·3.1

2.1 Find the greatest common factor and least common multiple of 36 and 60. A price rises 25% then falls 20%. Find its overall percentage change.

3 Exam-style questions

3.1 An integer n has remainder 5 on division by 8. Find the remainder of $3n + 7$ on division by 8, including for negative n . A value rises 10% in one year and 20% the next. What single percentage reduction restores its original value?

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Local review checklist: follow every response instruction; support the answer with the stated evidence; explain rejected alternatives or an opposing view; check scope, restrictions and clarity. For writing, this is a formative checklist, not an official rubric score.